Scientific, Technological Research and Economic Growth:
Some Implications for the CGIAR

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The presentation will briefly describe the structure of science and technology in developed countries which are responsible for about 93 percent of all global expenditure in science and technology. The private sector provides more than 60 percent pf all expenditures on science and technology in these countries. These countries took the lead in fields such as in communications, information sciences, transportation, and agriculture. Technological advance is the main source of their long-run economic growth. The expected gain from R&D is well illustrated by the fact that those OECD countries which lag behind in terms of R&D intensity are in the process of catching-up with the leaders. The main source of funding for R&D in developed countries in the private sector.

The situation of emerging countries is quite different. These countries grew, sometimes at record speed, thanks to reallocating resources, deeper integration in international trade, investment in imitating and adapting the technology available in developed countries and, to a much lesser extent, in specific innovation. In several instances and in selected fields, they are bridging the technology gap with the more advanced countries. The public sector in the middle income countries provides more than 74 percent of expenditure on scientific and technological research. Publicly funded agricultural research there is relatively larger than the amount spent on this sector by the public sector in OECD countries.

The case of low income countries is again totally different. Even though, they are able to grow by reallocating resources more efficiently, by adopting a better governance and trying to integrate world markets, imitation and adaptation of advanced technology are both less effective and less relevant because:

- Uneven mix of productive factors including availability of capital and skilled manpower;

- Very different output mix with most components without appeal for research in advanced countries.

- Low income countries suffer from limited public resources needed for investment in adaptation/imitation and innovation. Also, the private sector is little dynamic in R&D.

- Imported innovations are more difficult to fit into traditional goods. There is a frequent lack of opportunities for exploiting economies of scale present in more advanced countries.

After reviewing the conditions of science and technology in the developed, middle income and low income countries, the presentation will explore what the CGIAR can do to add to its already impressive record of achievements in low-income countries.

The CGIAR has been making valuable contribution to building research capacity in the field of agriculture and related fields to achieve sustainable food security and reduce poverty in developing countries. Without any doubt, the CGIAR has been a good substitute of both private and public sectors' technological research in poor countries. But two questions arise about how the CGIAR can pursue its mission in low-income countries in the light of the preceding analysis of the role of scientific and technological research in economic growth.

The first question relates to the bias towards food crops produced in less favorable zones in developing countries: Does this research really intend to render the producers of these commodities in low developing countries more self-sufficient or more competitive? It is true that natural conditions in most low-income countries are different from those in rich countries where most of the innovation takes place. The CGIAR thus compensates for the lack of R&D in low-income countries. But in view of the progress of global trade, is it sufficient for low-income countries to compete in the market place?

The second question draws on the preceding one and relates to the need for diversification in the rural economy. Should the CGIAR research on food crops in developing countries shift to high value crops? Should such shift also support research on the total production chain including increasing productivity, improving marketing and processing quality, especially for those commodities which do not receive attention from research conducted in OECD countries?.